Published in final edited form as:
J Pediatr Adolesc Gynecol. 2009 August ; 22(4): 233–237. doi:10.1016/j.jpag.2008.11.001.

Contraceptive Withdrawal in Adolescents: A Complex Picture of Usage

Jennifer L. Woods, M.D., M.S., **Devon J. Hensel, Ph.D**, and **J. Dennis Fortenberry, M.D., M.S.**
Section of Adolescent Medicine, Indiana, University School of Medicine, Indianapolis, Indiana

Abstract

Study Objective—Contraceptive withdrawal, or coitus interruptus, is a widespread method in adolescents, but factors affecting usage have not been longitudinally investigated. Study objectives were to examine usage numbers of withdrawal among a group of sexually active adolescent females and to investigate the influence of personal, partner, and family factors on usage patterns.

Design/Setting/Participants—Subjects (N=387; 14 to 17 years at enrollment; 92% African American) were recruited from primary care adolescent health clinics in areas with high rates of pregnancy and sexually transmitted infection. As part of a larger longitudinal study, subjects contributed face-to-face quarterly and annual questionnaires assessing contraceptive behavior, recent sexual behaviors, as well as partner- and family-based attitudes/beliefs.

Interventions, Main Outcome Measures—The outcome variable was: *withdrawal use during the previous 12 weeks* (no/yes); predictor variables included 19 individual, family and partner variables. All models additionally controlled for *any current hormonal use* (no/yes; any method), *current condom use* (no/yes) and *past withdrawal use* (past 30 days; no/yes). Logistic regression, with GEE estimation to adjust for repeated within-subject observations, was performed in SUDAAN, 9.0.

Results—Subjects supplied 1632 quarterly interviews; withdrawal was mentioned in about 25% of the interviews (392/1632). Controlling for primary contraceptive method, withdrawal was mentioned in 13.2% (51/307) of interviews with hormonal methods, in 32.4% (255/787) of the interviews with condoms and in 4.7% (78/1632) of interviews in with no method. Current hormonal use was associated with a decreased likelihood of also using withdrawal (OR=0.34), whereas past withdrawal use increased the likelihood of current withdrawal by about four-fold (OR=4.18). Condom use was not associated with withdrawal use. Current withdrawal use was more likely with a more diverse sexual repertoire (OR=1.65), more sexual partners in the past three months (OR=1.46), higher sexual control (OR=1.15), lower perceived STI risk (OR=0.46), higher sexual self-efficacy (OR=1.24), lower sexual coercion (OR=0.56) higher condom negativity (OR=1.16), living with a boyfriend (OR=2.17) and lower family sexual health support (OR=0.88).

Corresponding author: Jennifer L. Woods, MD, MS, Assistant Professor of Pediatrics, Division of Adolescent Medicine, Arkansas Children's Hospital, University of Arkansas for Medical Sciences, 800 Marshall Street, Slot 512-9, Little Rock, Arkansas 72202, (501) 364-5358 phone, (501)364-6728 fax, WoodsJenniferL@uams.edu.

Disclaimers: None

Conclusion—Contraceptive withdrawal in adolescents should not be considered 'rare'. Careful clinical consideration of usage within the context of other contraceptive behaviors, sexual behaviors/attitudes, and relationship issues could better inform effective contraceptive counseling efforts.

Keywords

Withdrawal; Contraception; Adolescents

Contraceptive withdrawal, or coitus interruptus, has existed as a form of birth control since ancient times, although its popularity decreased during the mid-to late 20th century [1–4]. In countries such as Turkey, Lebanon, Bangladesh, Philippines, and several former Soviet republics, withdrawal remains the primary method of birth control [5–8]. Withdrawal is widely utilized, and when employed correctly, involves the removal of the penis from the vagina before ejaculation; this also requires having the penis away from contact with the woman's external genitalia and cervical secretions [9]. This 'perfect' usage has a failure rate of 4% [10]. However, actual failure rates are much higher, with first-year method failure rates of up to 27%, second only to periodic abstinence [10–12]

About 10% of sexually active adolescent women use withdrawal in at least some circumstances, even if not for a primary method, and even if the method provides no protection against sexually transmitted infections [13]. Failure rates in adolescent women of 25% are similar to other age groups [10]. Reasons cited for usage – among both adolescent and adult women – include ease of usage, no cost, no visit required to the doctor or pharmacy, privacy of the method, removal of contraceptive burden from the woman, ease of access, lack of health risk, and lack of knowledge [9]. These reasons may be especially salient to adolescents for whom embarrassment and restricted access to contraceptive services may be especially relevant.

Relationship characteristics may also influence adolescents use of contraceptive withdrawal, with increased use often utilized by adolescents in the context of established relationships, where a level of 'trust' is felt to dispel notions of perceived STI risk or pregnancy concern[15]. Such usage indicates that reasons other than primary pregnancy and STI prevention may be involved in withdrawal usage by adolescents.

Despite being mentioned as a contraceptive method in many contexts, few studies of withdrawal involve adolescent users. In addition, factors affecting usage of withdrawal have not been investigated in an adolescent population, especially on a longitudinal basis. The study objective of this study were (1) to examine the usage numbers of withdrawal as a contraceptive method among a group of sexually active adolescent females and (2) to investigate the influence of personal, partner, and family factors on usage patterns.

Methods

Study Design and Data

Data were collected as part of a longitudinal cohort study of sexual relationships, sexual behaviors and sexually transmitted infections among young women in middle- to late-adolescence. Data were obtained from face-to-face interviews performed at enrollment quarterly interviews and annual questionnaires that assessed contraceptive behavior, recent sexual behaviors, as well as partner- and family-based attitudes/beliefs. Each participant provided at least two and as many as 10 quarterly interviews across 27 months. However, as the study is still ongoing, and not all participants have completed the same follow up period, and therefore have contributed different amounts of data. No significant differences were found between number of follow up periods contributed and age, race/ethnicity and other demographic variables (data not shown; available from first author). Interviews lasted between

35 and 40 minutes, and subjects were compensated $20.00 for each interview completed. More detailed descriptions of these methods are available elsewhere[16–18]. The larger study was approved by the Institutional Review Board of Indiana University School of Medicine.

Participants

Subjects were 387 adolescent women receiving health care as part of the patient population in one of three primary care adolescent health clinics in Indianapolis. These clinics serve primarily lower- and middle-income families who reside in areas with high rates of pregnancy and sexually transmitted infection. Potential participants were eligible if they were 14 to 17 years of age (mean age at enrollment = 15.33, SD=1.06), spoke English, and were not pregnant at study enrollment. For the larger study, participants who became pregnant continued in the project; however, analyses in the present study were limited to those adolescents who were not pregnant. Approximately 92% of the sample reported race/ethnicity as African-American; therefore, race was not used as a predictor in this analysis.

Measures

Outcome Variables—The outcome variable was *withdrawal use during the previous 12 weeks (no/yes);* this item was extracted from a set of variables with other contraceptive possibilities (no/yes), including "withdrawal," "avoiding sex certain times of the month to avoid pregnancy," "condoms," "spermicides," "oral contraceptive pills," "Depo-Provera®," "contraceptive patch," "intra-uterine device," "tubal ligation," "emergency contraception," "diaphragm," and "contraceptive ring." Subjects were also asked if any of these methods was their "current" (no/yes) method of contraception.

Predictor Variables—Three domains of predictor measures were chosen to represent individual, relationship and family based characteristics potentially associated with withdrawal use. As indicated below, some measures were measured at the quarterly interviews, while others were measured in annual questionnaires. In the latter case, to make comparisons to quarterly data, the annual questionnaire closest in date to the quarterly visit was used. Additionally, all models controlled for *any current hormonal use* (no/yes; any method), *current condom use* (no/yes) and *past withdrawal use* (past 30 days; no/yes).

Individual Measures—In this domain, measures of interest included were sexual behaviors and other person-centered attitudes and experiences.

Sexual self-concept, measured in annual questionnaires, was addressed by 4-point Likert items (strongly disagree to strongly agree) in separate three item sub-scales adapted from research with adults [19] with similar item content to those developed for adolescents [20, 21]. Subscales included: *sexual openness* (4 items; α=0.80 at baseline; range 4 – 16; e.g., *I would be willing to try most kinds of sex at least once; sexual self-esteem* (4 items; α=0.83 at baseline; range 4 – 16; e.g., *I like the ways in which I express my sexuality*); and *sexual anxiety* (5 items; α=0.84 at baseline; range 5 – 20; e.g., *Sometimes in sexual situations I worry that things will get out of hand*). Each subscale was scored such that higher scores in each reflected a greater degree of each variable.

Past sexual coercion, taken from annual questionnaires, was an additive index of 4-Likert type items (α=0.83; *never, once, two times or more; e.g., How often has someone used physical force to make you have sex?*) assessing the frequency of unwanted or forced sexual contact in the past year. *Religiosity*, taken from annual questionnaires, was an additive index of four 3-category Likert type items assessing the importance of religion in the adolescent's life (α=0.83; *not important, important, very important; e.g., How important is it to you to believe in God*). .*Perceived STI risk*, taken from quarterly interviews, was a single 3-category Likert type

item assessing the extent to which an adolescent estimated their chances of acquiring an STI in the next year (*probably, 50–50, no chance at all*).

Sexual conservatism, taken from annual questionnaires, was an additive index of four 3-category Likert type items assessing the importance of delaying sex in the adolescent's life (α=0.83; *not important, important, very important; e.g., "To wait to have sex until you're married?)*. *Negative condom attitudes*, taken from annual questionnaires, was an additive index of two 4-category Likert type items assessing the importance of religion in the adolescent's life (α=0.83; *strongly disagree to strongly agree; e.g., "When I suggest using a condom, I am almost always embarrassed")*.

Finally, sexual behavior variables, taken from quarterly interviews, included *number of recent sex partners (past 3 months)* and *sexual repertoire*, an 11-item additive index of coital and non-coital behaviors (no/yes) reported by the adolescent in the past three months. These sexual behaviors included assessments of vaginal and anal sex, as well as cunnilingus, fellatio, received and given genital touching, kissing, holding hands, dancing, and breast touching.

Partner Measures—Partner measures assessed partner specific attitudes and beliefs in the past three months. However, since the present analysis was not partner specific, all measures were aggregated across an adolescent's total reported partners to produce one measure, per adolescent, per quarterly interview. These measures were then matched to subjects' reported quarterly information.

Relationship Quality was a six, 4-point Likert type item (α=0.94; *strongly disagree to strongly agree; e.g., "We enjoy spending time together"*) evaluating relationship aspects with specific sex partner. Further, *relationship satisfaction* (α=0.97) and *sexual satisfaction* (α=0.98) were five item, 7-point Likert type valence scales (e.g., *very bad to very good; very unsatisfying to very satisfying)* measuring general feelings about relationships and sexual behavior.

Sexual Control was an additive index of three 4-point Likert type items (α=0.77; *strongly disagree to strongly agree; e.g., ""It is easy for me to say no if I don't want to have sex"*).

Family Measures—All family measures were taken from annual questionnaires. *Lived with family* (no/yes) and *lived with boyfriend* (no/yes) were used to probe how patterns of residence may influence contraceptive behavior. The former was constructed from multiple items and reflects a wide variety of potential family members. Alternative analyses with specific type of family and number of family members did not yield meaningful results (data not shown).

Sexual health support was an additive index of three 4-point Likert type items (α=0.86; *strongly disagree to strongly agree; e.g., "My family would help me get condoms if I asked"*) measuring adolescent perceived family support about sex and health. *Attitudes about sex* (α=0.83; e.g., "*My family thinks that sex before marriage is okay if people care for one another*) and *attitudes about teen pregnancy* (α=0.82; e.g., "*My family would be "okay" if I got pregnant"*) were additive indices of two, 4-point Likert type items (*strongly disagree to strongly agree)* assessing family endorsement of various issues.

Procedure

Logistic regression was used to assess predictor variables' influence on contraceptive withdrawal in the past 90 days. Because subjects contributed multiple 3-month observation periods, a generalized estimating equation (GEE) approach adjusted estimates for multiple observations on the same individual[22]. Estimates were considered statistically significant at $p<.05$ if the 95% confidence intervals did not contain 1.0. All analyses were performed using SUDAAN, Version 9.01 [23].

In total, four models were evaluated in order to systematically assess contraceptive withdrawal use as a function of contraceptive behaviors (current hormonal use, current condom use and past withdrawal use (in the interview prior to the current interview: no/yes) (Table 1), and individual, partner, and family variables, controlling for contraceptive behaviors (Table 2).

Results

Subjects (N=387) contributed 1632 quarterly interviews. Overall, 24.8% (392/1632) of interviews were associated with *any* contraceptive withdrawal in the past three months; 18.8% (307/1632) of interviews were associated with *any* hormonal contraceptive use in the past three months, and about 42% (787/1632) associated with *any* condom use in the past three months. Withdrawal was also used in 13.2% (51/307) of interviews where hormonal methods were the primary contraceptive method, in 32.4% (255/787) of the interviews where condoms were the primary contraceptive method, and in 4.7% (78/1632) of interviews in which there was no other contraceptive method reported, including withdrawal.

Table 1 reports the influences of primary and past contraceptive method on current contraceptive withdrawal use. Current hormonal use was associated with a decreased likelihood of also using withdrawal (OR=0.34), whereas past withdrawal use increased the likelihood of current withdrawal by about four-fold (OR=4.18). Condom use was not associated with withdrawal use.

Focusing on individual influences, and controlling for the influence of hormonal methods, condom use and past withdrawal use (Table 2), current withdrawal use was more likely with a more diverse sexual repertoire (OR=1.65), more sexual partners in the past three months (OR=1.46), higher sexual control (OR -1.15), lower perceived STI risk (OR=0.46), higher sexual self-efficacy (OR=1.24), lower sexual coercion (OR=0.56) and higher condom negativity (OR=1.16).

Among partner and family influences, controlling for the influence of hormonal method, condom use and past withdrawal use (Table 2), contraceptive withdrawal was associated with living with a boyfriend (OR=2.17) and lower family sexual health support (OR=0.88).

Discussion

Contraceptive withdrawal is a frequently used method in a sample of relatively high-risk, largely African-American adolescents. The data give a 3-month point prevalence of withdrawal use of about 25%, suggesting that adolescents' usage of withdrawal as a contraceptive method should not be considered 'rare'. Rather, such results indicate that withdrawal occurs in a meaningful number of coital situations.

An important contribution of this research is the finding that a substantial proportion of adolescents' use of withdrawal is in combination with other contraceptive methods. Although withdrawal may be chosen as a primary contraceptive method, it also appears intertwined in the context of other methods--both hormonal contraception and condoms. Thus, the concept of dual method normally attributed to hormonal and barrier method combinations may need to be expanded to consider withdrawal as an alternative or optional experience associated with a given coital act.

Situational factors associated with the occurrence of withdrawal within a specific sexual encounter are still unclear. However, withdrawal does not seem to be a random behavior implemented only as a contraceptive last resort during spontaneous, unanticipated sexual activity. Rather, an array of individual, relationship, and family influences appear to influence withdrawal use in understandable, albeit contraceptively ineffective, ways. This suggests that

a careful clinical consideration of withdrawal use within the context of other contraceptive behaviors, sexual behaviors and attitudes, and relationship issues could better inform effective contraceptive counseling efforts.

Limitations of study design and sample must be assessed in consideration of our results. The study participants were primarily African-American young women receiving care in an urban setting. Both STI and pregnancy rates were high in this population; while these data are therefore not representative of adolescent women as a whole, they do shed light on a formerly under-explored contraceptive topic. Due to the limited existing longitudinal data on withdrawal usage in adolescents, our numbers cannot be compared to any other studies for similarity and must be examined on a stand alone basis. Given the limited knowledge of a century-old method that our study has shown to be commonly used even today, further investigation into patterns of usage within relationships (short or long-term) will be important into more fully understanding withdrawal as a method of contraception. Such information, once obtained, would assist not only in knowledge of usage patterns but aide clinicians developing pregnancy and STI prevention programs by adding a little talked of, commonly used, and rarely effective used method of contraception.

Acknowledgements

The study was funded in part by National Institutes of Health (NIH) R01 HD 044387 and U19 AI031494-15. All individuals with significant contributions to the work have been listed.

Sources of Support: NIH R01 HD 044387 and U19 AI031494-15

References

1. Maguire, DanielC. Sacred Choices: The Right to Contraception and Abortion in Ten World Religions. Minneapolis: Fortress Press; 2001.
2. Riddle, JohnM. Contraception and Abortion from the Ancient World to the Renaissance. Cambridge, Massachusetts: Harvard University Press; 1992.
3. Brodie, Janet Farrell. Contraception and Abortion in 19th-Century America. Ithaca, New York: Cornell University Press; 1994.
4. Watkins, Elizabeth Siegel. On the Pill: A Social History of Oral Contraceptives, 1950–1970. Baltimore, Maryland: The Johns Hopkins University Press; 1998.
5. Ortayli N, Bulet A, Ozugurlu M, Cokar M. Why Withdrawal? Why Not Withdrawal? Men's Perspectives. Reproductive Health Matters 2005;13(25):164–173. [PubMed: 16035610]
6. Chowdhury GA, Caldwell B, al-Sabir A. Coitus-dependent family planning methods: observations from Bangladesh. Studies in Family Planning 1999;30(1):43–53. [PubMed: 10216895]
7. Myntti C, Ballan A, Dewachi O, et al. Challenging the Stereotypes: Men, Withdrawal, and Reproductive Health in Lebanon. Contraception 2002;65(2):165–170. [PubMed: 11927120]
8. New Survey Findings: The Reproductive Revolution Continues. Chapter 36. Population Reports 2003;31(2)
9. Finger W. Contraceptive Update: Withdrawal Popular in Some Cultures. Network 1996 Fall;17(1):1–4.Fertility Awareness
10. Hatcher, RA.; Trussel, J.; Stewart, F., et al., editors. Contraceptive Technology. Vol. 18th Revised Edition. New York, NY: Contraceptive Technology Communications, Inc.; 2004. p. 311-313.
11. Ranjit N, Bankole A, Darroch JE, Singh S. Contraceptive Failure in the First Two Years of Use: Differences Across Socioeconomic Subgroups. Family Planning Perspectives 2001;33(1):19–27. [PubMed: 11271541]
12. Fu H, Darroch JE, Haas T, Ranjit N. Contraceptive Failure Rates: New Estimates From the 1995 National Survey of Family Growth. Family Planning Perspectives 1999;31(2):56–63. [PubMed: 10224543]

13. Everett SA, Warren CW, Santelli JS, et al. Use of Birth Control Pills, Condoms, and Withdrawal Among U.S. High School Students. Journal of Adolescent Health 2000;27:112–118. [PubMed: 10899471]

14. Emans, SJ.; Laufer, MR.; Goldstein, DP., editors. Pediatric and Adolescent Gynecology. Vol. Fourth Edition. Philadelphia, PA: Lippincott-Raven Publishers; 1998. p. 661

15. De Visser R. Delayed Application of Condoms, Withdrawal and Negotiation of Safer Sex among Heterosexual Young Adults. AIDS Care 2004;16(3):315–322. [PubMed: 15203425]

16. Fortenberry JD, Temkit M, Tu W, et al. Daily Mood, Partner Support, Sexual Interest and Sexual Activity Among Adolescent Women. Health Psychol 2005;24(3):252–257. [PubMed: 15898860]

17. Blythe MJ, Fortenberry JD, Temkit M, Tu W, Orr DP. Incidence and correlated of unwanted sex in relationship of middle and late adolescence. Arch Pediatr Adolesc Med 2006;160:591–595. [PubMed: 16754820]

18. Sayegh MA, Fortenberry JD, Anderson JG, Orr DP. Relationship quality, coital frequency and condom use as predictors of incident *Chalmydia trachomatis* infections among adolescent women. J Adol Health 2005;37(2):163–167.

19. Reynolds, MA.; Herbenick, DL. Using computer-assisted self-interview (ACASI) for recall of childhood sexual experiences. In: Bancroft, J., editor. Sexual Development in Childhood. Bloomington IN: Indiana University Press; 2003. p. 77-81.

20. O'Sullivan LF, Brooks-Gunn J. The timing of changes in girls' sexual cognitions and behaviors in early adolescence: A prospective, cohort study. Journal of Adolescent Health 2005;37:211–219. [PubMed: 16109340]

21. O'Sullivan LF, Meyer-Bahlburg HFL. African American and Latina inner-city girls' reports of romantic and sexual development. Journal of Social and Personal Relationships 2003;20:221–238.

22. Liang K-Y, Zeger SL. Longitudinal analysis using generalized linear models. Biometrika 1986;73:13–22.

23. SUDAAN. Version 9.0. Research Triangle Park, North Carolina: RTI International; 2005.

Table 1

Control Predictors of Withdrawal Use Among (N=387) Adolescent Women

	OR (95% CI)
Current Hormonal Use (Yes)	0.34 (0.07, 0.92)*
Current Condom Use (Yes)	0.59 (0.13, 1.08)
Past Withdrawal Use (90 Days: Yes)	4.18 (2.70, 6.49)*

Table 2

Individual, Family and Partner Predictors Withdrawal Use Among (N=387) Adolescent Women[a]

	Model 1	Model 2 OR (95% CI)	Model 3
Sexual Repertoire	1.65 (1.48, 1.90)*	--	--
Number of Recent Sex Partners	1.46 (1.11, 1.86)*	--	--
Perceived STI Risk	0.44 (0.26, 0.82)*	--	--
Religiosity	1.07 (0.91, 1.28)	--	--
Sexual Openness	0.91 (0.89, 1.02)	--	--
Sexual Anxiety	1.06 (0.99, 1.14)	--	--
Sexual Self-Efficacy	1.24 (1.02, 1.43)*	--	--
Past Sexual Coercion	0.56 (0.32, 0.89)*	--	--
Sexual Conservatism	0.94 (0.85, 1.04)	--	--
Negative Condom Attitudes	1.16 (1.08, 1.27)*	--	--
Relationship Quality	--	1.00 (0.96, 1.00)	--
Relationship Satisfaction	--	0.98 (0.95, 1.00)	--
Sexual Satisfaction	--	1.03 (1.00, 1.05)	--
Sexual Control	--	1.15 (1.05, 1.23)*	--
Live with Boyfriend (Yes)	--	--	2.17 (1.15, 2.60)*
Live with Family (Yes)	--	--	0.90 (0.51, 1.60)
Sexual Health Support	--	--	0.86 (0.83, 1.96)
Family Attitudes Towards Sex	--	--	1.12 (0.92, 1.37)
Family Attitudes Towards Pregnancy	--	--	1.07 (0.92, 1.22)

[a] All models controlled for current hormonal contraceptive use (no/yes), current condom use (no/yes) and past withdrawal use (3 months: no/yes)